RADIOISOTOPE BRIEF

Americium-241 (Am-241)

Half-life: 432.2 years

Mode of decay: Alpha particles and weak gamma radiation

Chemical properties: Crystalline metal that is solid under normal conditions. Am-241 can be combined with beryllium to produce neutrons.

What is it used for?
Am-241 is used in some medical, industrial, and commercial devices.

Where does it come from?
Am-241 is a manmade metal that is produced from plutonium. Am-241 found in the environment is the result of past nuclear weapons testing.

What form is it in?
Am-241 found in the environment is in the form of microscopic dust. Am-241 used in industrial, medical or consumer devices is in the form of small coin-sized metal or plastic discs.

Alpha particles are subatomic particles made up of two neutrons and two protons ejected from the nucleus of an unstable atom. These particles are not able to penetrate most materials—even a piece of paper or the outer layer of human skin can block an alpha particle. However, when alpha-emitting unstable atoms are inhaled, alpha particles become particularly dangerous because they will kill lung cells, which could lead to scarring and possible cancer. Gamma radiation is a packet of energy, sometimes called a photon, that is emitted from the nucleus of an unstable atom.

Gamma radiation can penetrate most substances because of its high energy (lead is the best barrier against gamma radiation). Gamma radiation can penetrate the human body and damage cells, which could lead to cancer later in life.

What does it look like?
Am-241 is a silver-white metal that is solid under normal conditions.

How can it hurt me?
As a dust or a fine power, Am-241 may cause certain cancers. When the powder is swallowed, absorbed through a wound or inhaled, it may be retained in the body for long periods of time. Once it circulates through the body, Am-241 concentrates in the bones, liver, and muscles, exposing these organs to alpha particles.

For more information about Am-241, see the Public Health Statement by the Agency for Toxic Substances and Disease Registry at http://www.atsdr.cdc.gov/toxprofiles, or visit the Environmental Protection Agency at http://www.epa.gov/radiation/radionuclides/americium.htm.

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For more information about health effects related to uranium exposure, see CDC's fact sheet on "Radiation and Health Effects," at www.bt.cdc.gov/radiation/healthfacts.asp.

For more information on protecting yourself before or during a radiologic emergency, see CDC's fact sheet titled "Frequently Asked Questions (FAQs) About a Radiation Emergency" at www.bt.cdc.gov/radiation/emergencyfaq.asp, and "Sheltering in Place During a Radiation Emergency," at www.bt.cdc.gov/radiation/shelter.asp.

For information on other radiation emergency topics,
visit www.bt.cdc.gov/radiation, or call the CDC public response hotline
at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY)

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